

# **Translating virtual architectures into ceramic form: experiments in clay slip**

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## **ABSTRACT**

### **Translating virtual architectures into ceramic form: experiments in clay slip**

I work with clay at the intersection of three defined constructed spaces: decorative expression, technological triumphs and functional applications. The manipulation of surfaces leads to decorative expression, and it is only through understanding the particular behaviors of clay and attention to process that technological success may be achieved. The functional applications afforded by the materiality of clay are many and varied: of particular relevance to this project was the application of clay slip, for its synergies with line, fluidity, and expressive potential.

Central to the project's aims was the particular technique of fluid pouring processes as a method of translating the schematics and geometric mapping systems prevalent in computer aided modes of object design and 3D modeling programs, into material form.

Methodologies developed from both hand and computer-aided drawing informed these fluid pouring processes that deposited slip by using layering, slicing, merging, drawing, depositing, building and exposing architectural structures. The interpretation and adaption of these methodologies prompted me to respond and deviate from computer generated drawings as a way of investigating the dialogue between structure and surface within the field of ceramics.

A high value was placed on material processes, expression and intuition. This manifested into the development of a controlled application of clay slips of differing viscosities to essentially draw an object into form from the ground up, comparable to the way in which current 3D printers construct form in slices and layers, or how some organic life forms, coral for example, deposit calcium as they expand their colony.

The designers, architects, and artists who provide the relevant context for this research include Andrew Kudless, and Lab Architects, who employ various

technologies to enhance object design. Their manufactured surfaces also evoke qualities of other matter, extending bold aspirations for what is possible in the constructed sphere. In contrast, ceramic artists Kenji Uranishi and Rebecca Catterall create objects that are pared back and expose an inner and outer structure. In diverging from attempts to generate or replicate design objects, the experiments carried out aimed instead at extending the vernacular of slip trailing through embracing error as a means of generating unique form.

The outcome was a series of experimental objects created with clay slip, which interweaved aspects of digital technology and material processes. These responses produced this series of speculative forms.

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## **INTRODUCTION: Surface becoming structure**

During my first degree at the Tasmanian College of the Arts my work conformed to a conventional set of ideas relating to ceramics. I abided by the ceramic object having a utilitarian functionality, built up around a supporting structure, with surface treatments subsequently applied as a form of decoration.

During my Honours year, however, techniques that included slip trailing, traditionally for decorative functionality, were explored for their capacity to construct form. The focus of the ceramic object moved from being considered for functionality, to expressive potential. This generated forms that negotiated the intersection of structure and surface.

This project emerged from those concerns, and aims to extend the particular technique of fluid pouring processes. This acts as a method of translating the schematics and geometric mapping systems prevalent in computer aided modes of object design and 3D modelling programs into material form, with a confluence of expressive and intuitive understanding and heightened technical resolve.

Clay is a complex, versatile and active material. It is a material that is responsive to various making techniques, having been used for centuries by civilisations in a wide range of capacities, from the art object, the humble bowl and even the outside tiles of space ships. This project focuses on working with the fluidity of clay, which presents numerous challenges when constructing forms. The element of surprise and control over what is

perceived as unpredictable leading to then intuitively embracing potential shift justifies the implications of working with this material.

I therefore see my research as working through material thinking. Barbara Bolt (2006) argues that:

Material thinking offers us a way of considering the relations that take place within the very process or tissue of making. In this conception the materials are not just passive objects to be used instrumentally by the artist, but rather the materials and processes of production have their own intelligence that come into play in interaction with the artist's creative intelligence.

(Bolt 2006, p.1)

The way I engage with a material dialogue in the process of making, and with which my research outcomes develop from the specificities and qualities inherent in clay, not only define my methodologies but form the heart of the project's research investigation.

The project's central arguments are as follows:

1. The functional applications afforded by clay slip, when considered as a structural rather than decorative form, creates the capacity for a fluid, expressive and organic architecture to emerge.
2. The deviations which emerge through the intersections of digital technologies and analogue processes - pouring, trailing and drawing with slip - expands our understanding of form and geometry, and extends synergies with the organic rather than the Cartesian matrix.
3. The general problem, posed in ceramics, was to find a suitable means to



navigate these concerns at the intersection of space, structure and surface.

4. The outcome was a series of experimental objects created from clay slip that interweave and respond to aspects of digital technological and material processes in producing a series of speculative forms.

This exegesis supports the outcomes of this project by considering the project under three headings: decorative expression, technological triumphs and functional applications.

## 1. DECORATIVE EXPRESSION

Slip has historically been used a technique for decoration, but my research has taken slip from the surface to structure. This brief survey is intended to locate my project alongside artists working within similar concerns, starting with the origins of slip as a decorative element. However, I argue that its structural component has always been inherently present.

Potters have practiced the art of decorating pots with slip for hundreds of years, using the slip trailing process whereby the slip is squeezed out through a small aperture that fits comfortably in the hand onto the surface of a pot. This additive technique gave the potter the opportunity to apply their fluid drawing style to the surface of the pot, and provided a suitable means to record designs and patterns that expressed interests of their day and culture.

The dotted and trailed slip decoration was arguably never so well executed as in 17<sup>th</sup>-century England, where the North Staffordshire potters depicted human and animal figures, stylised flowers, and fluid linear patterns. The technique demanded great dexterity and control (Shafer 1976). During the pre-industrial era, Thomas Toft (Died 1698) particularly utilised the cross-hatching of clay slip on the rims of commemorative platters, an inspiration for the constructional ideas for my work (Figure 1).



Figure 1: Thomas Toft, 1600s, Commemorative Plate, earthenware.

Toft's decorative techniques were further developed by Josiah Wedgwood (1730-1795), whose accomplishments were enormous and diversified. Wedgwood made extensive tests to achieve his desired results. Gay Blake-Roberts (2011) quotes Wedgwood as saying his time is completely absorbed with experimenting in an attempt to develop the Jasperware ceramic body. These experiments left him with feelings of frustration because the materials seemed to have a mind of their own, an experience which was mirrored in my own project and which is discussed further in the third section of this exegesis.

His wares appealed particularly to the rising European bourgeois class who were into decorating their homes in the neo-classical style. His work with architects the Adams Brothers had an influence on the embellishment of middle-class homes. Donald Towner (1968) claims that the work of Wedgwood at the time was about creating false ideals of the rising class. I,

on the other hand, see it more about technological advancements opening up imaginative potentials for Wedgwood's compulsive experimentation with materials. He gave a 3-dimensional space to the Greek iconography which he then used in the functional sphere. The precise geometric decoration of the Sweetmeat basket of the 18<sup>th</sup> century (Figure 2) is an example of the success he was able to achieve because of his extensive experimentation with materials. The openness of the trellis patterning was also inspired by the openness the incising created on the lid of the vessel.



Figure 2: Josiah Wedgwood, Sweetmeat Basket (Blake-Roberts 2011, p.14)

Inspired by these different decorative methods, I became fascinated with the idea of taking this two-dimensional ceramic drawing method off the pot and using it as a means of constructing form. The creative seed for this research project was adding layer upon layer, watching the forms grow and take on a life of their own, as seen in this close-up image of an earlier experiment (Figure 3).

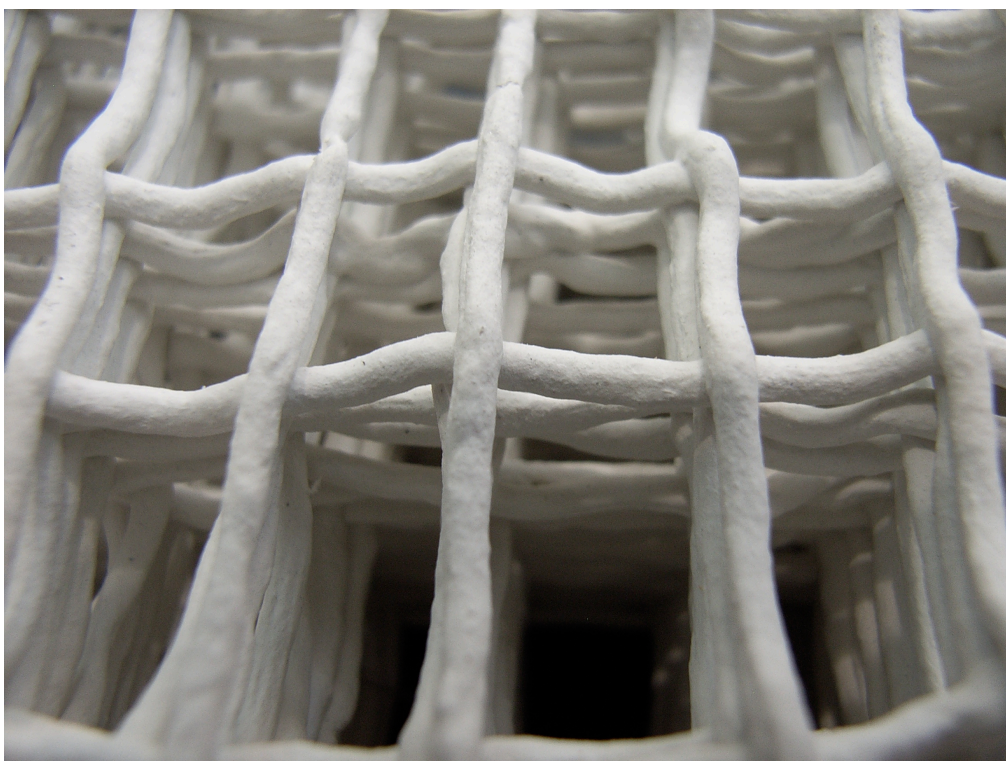


Figure 3: Sonja Brough, 2011, detail of test piece

While few ceramicists use the slip trailing process for creating structure because of the challenges and difficulties of working with this material, there are contemporary ceramic artists who investigate surface, structure and space in this mode.

One of those artists is Antonella Cimatti who also pushes the material boundaries of the fluid slip trailing technique to construct delicate bowls. Cimatti states on her website 'it's an art of addition, not of subtraction, as was commonly done in the original Renaissance crespines, where the perforations were created by piercing and cutting out shapes from the existing closed forms' (Cimatti n.d.). She has studied Italian Renaissance architecture and translated this decorative style into an organic object and giving the decorative a contemporary voice to her ideas of feminine construct (Figure 4) (Caruso 2012).



Figure 4: Antonella Cimatti, 2009, *Crespina con rose*, handbuilt in porcelain paperclay, w 30, h 12.5 cm.

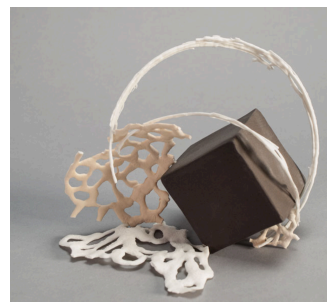


Figure 5: Hana Balaban, 2014, *Tipping Point*, porcelain, 14 x 16 x 19 cm.

Hana Balaban uses ceramic slip to create small hand-patterned grid structures and then assembles these together after they are fired. She is concerned with expressing ideas of vulnerability and fragility of the human psyche with her ceramic assemblages (Figure 5). The novelties of her spatial arrangements extended the possibilities of the expressive qualities of the ceramic object. Balaban includes broken intersections in these works. In the field of ceramics once an object/vessel is broken it is usually rendered useless. To continue its life as a fragment, disjointed from its original functional purpose, in my work the broken line becomes a visual resting

space, a place where other experimentations can grow and develop.

When thinking about the gestural qualities of the line I turned to the master of line himself, Sol LeWitt (1928-2007) modernist painter. The Art Gallery of NSW held an exhibition encapsulating 40 years of LeWitt's work. Titled *Your mind is exactly at that line*, it is summarised with a quote from his *Paragraphs on conceptual art*: 'There are three basic kinds of lines: straight, not straight and broken'. He used mathematical equations as a basis for the construction of his artworks. It would be feasible to think that this methodology would create exclusively predictable outcomes but according to the Art Gallery of NSW (as stated on their website) 'Not even LeWitt could predict the form of the final work and he was often surprised by its aesthetic appeal'. In the context of my work the decorative elements of line become structural and the interplay of line and form is vital. Sol LeWitt's work, *White Styrofoam on black wall* reveals engaging arrangements that can be produced through unrelated parts (Figure 6). The broken lines in my works also play an unashamed role in the aesthetic arrangements. A space for conceptual ponderings.



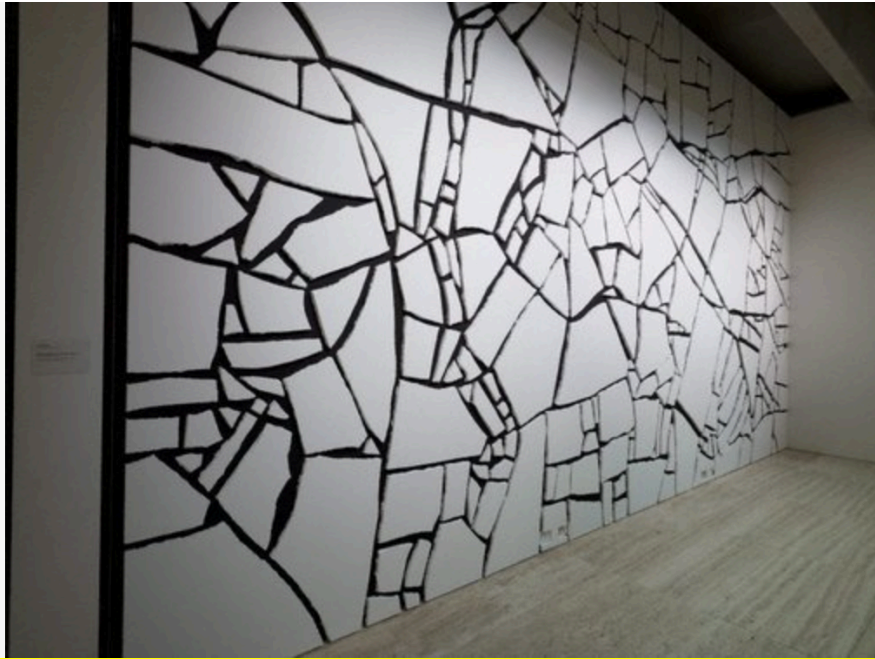


Figure 6: Sol LeWitt, 1994, *White Styrofoam on black wall*, styrofoam, synthetic polymer paint, dimensions variable.

Although Kenji Uranishi a Japanese ceramic artist living in Australia (Figure 7) and Rebecca Catterall a UK born ceramic sculptor (Figure 8) use very different clays and techniques to create their artworks, similarities to this research emerge in the use of clay to construct ceramic works which make reference to repeated simple elements. This repetition appears to instill an effect of optical displacement whilst referencing architectural constructs and concrete structures.





Figure 7: Kenji Uranishi, 2014, *Sanctuary Zureta*, glazed porcelain, 20 x 16 x 15 cm.



Figure 8: Rebecca Catterall, *FoldFlipFlap*, 2004, clay, h 28 x w 30.

These repeated elements also have reference to the repetitive nature of building. Hundreds of these small elements have been organised and constructed into architectural sculptures. Repetition and organisation are also themes that are apparent in the methodology and process engaged in during the construction of my objects. To construct a line over and over again gives me the knowledge to be able to work with that line in an intuitive way; a method of learning while immersed in the process of doing. Although at times I feel like I repeat for the sake of repeating. Building up a collection of spare parts and apparently 'unnecessary' accessories, to later be re-engaged and revitalised (many of these ideas can be packed in boxes idly waiting to be used in other works).

The use of colour in my work is used to enhance the visual vibrations of the forms, either giving depth to or flattening a surface. An example of this is

when I work through a building up of the surface with singular lines of slip and cutting back the surface of the vessels I call Smugs (Figures 9 and 10).



Figure 9: Sonja Brough, 2012, Smugs on the gallery wall, porcelain, coloured slips

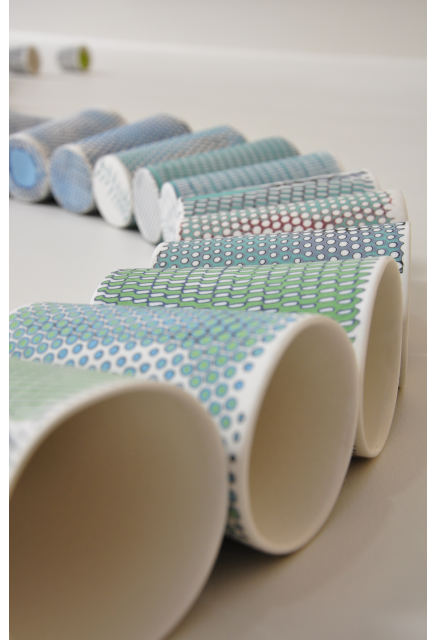


Figure 10: Sonja Brough, 2012, Smugs on the gallery wall, porcelain, coloured slips

The process of cutting the surface away creates similar sensations as when building up the surface. Each of these opposing actions inform each other by drifting back and forth, allowing time for mediation and rest of the internal, mental strategies, balancing each process.

The patterning of the smugs developed from taking a casting mold of textured disposable coffee cups. Layers of coloured underglaze are applied to the surface of the slip-cast cups. Once they are low bisque fired I then proceed to sand the surface. This cutting a way action is distinctive for each piece giving them a sense of individuality.

I examined the works of French Hungarian modernist painter Victor Vasarely 1906-1997, for ideas of colour combinations of line in the flat surface. It was his Vega series in the late 1960s that I was particularly interested in (Figure 11) I initially started with the bloated grid, developed in the computer through digital drawings, and applied shadow only (Figure 12), opposing the optical achievements of Vasarely, who had distorted the surface through application of colour alone.

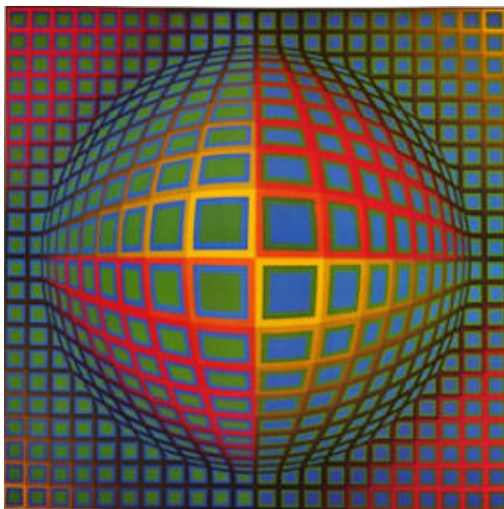


Figure 11: Victor Vasarely, 1969, *Vega-Nor*, acrylic on canvas, 200x200cm.

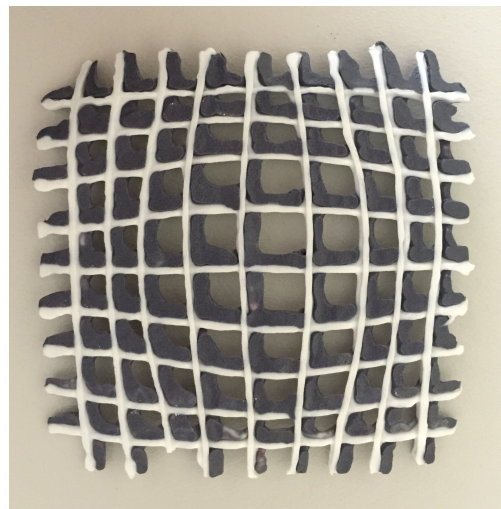


Figure 12: Sonja Brough, 2011, *Bloat test*, porcelain, coloured slips

Vasarely's paintings are based on globular alterations to a polychromatic grid. The surfaces jump out at you, giving the illusion of depth and movement when it is actually a super-flat surface. This led me to the creation of the bloat series; four panels, which are the virtual landscape lifted from the screen and placed in reality (Figure 13).

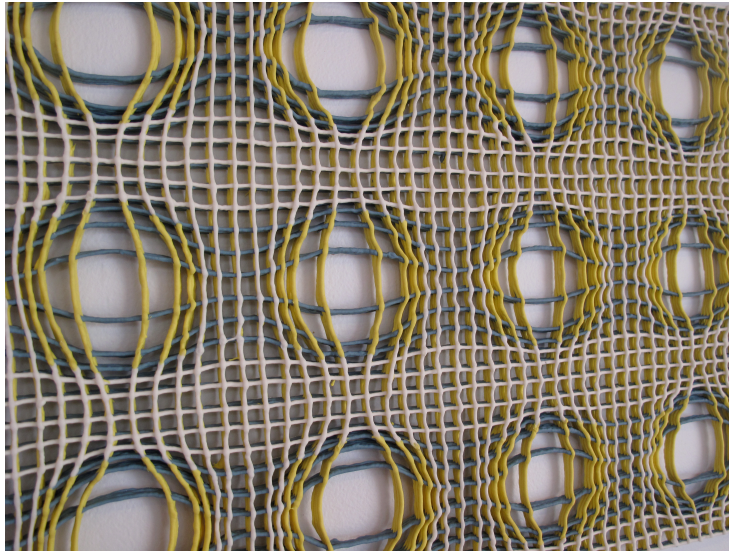


Figure 13: Sonja Brough, 2011, Bloat Panel test, porcelain, coloured slips

During the creation of these panels, further developments arose of what I termed 'Stubbies'. These became a three-dimensional form that I experimented with in a stacking context. Blocking entrances and having people jump the work for added dramatic effect (Figure 14), these pieces embodied the previously flattened scheme into a pseudo-performativity event. This experimental series bridged a void between the underlying utilitarianism form of the 'Smugs' and the visual of the line and grid.



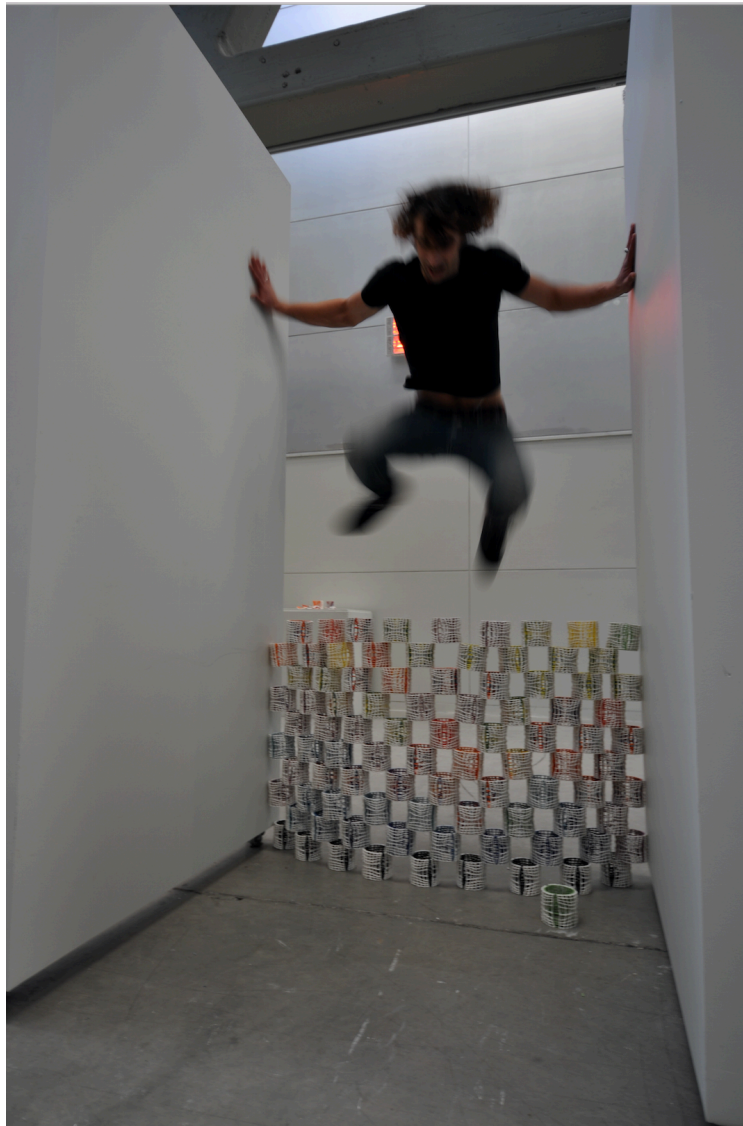


Figure 14: Sonja Brough, 2011, Stacking Stubbies, porcelain, coloured slips

In these, slip has begun to transcend decoration to become structure, surface and space simultaneously. This use of slip presented initial technical challenges and required the conception of ceramic work as akin to structures applied in architecture. This led to further research and ideas that I will explore in the next section.

## 2. TECHNOLOGICAL TRIUMPHS

This section explores the technical and technological challenges of my project. My work is a complex interplay of digital technologies and analogue processes. Deviations within these processes, resulting from the materiality of clay and my response, expanded the construction of form and geometry.

While the use and metaphors of computerised and industrial production methods are prominent in my conceptual grasp of the project, there is also an integral organic aspect to making as well.

The computer flat screen provides me with the starting ground for many of my experimentations. This often begins by constructing warped grids in programs such as Adobe Illustrator (Figure 15) or slicing up vessels in Rhinoceros (Figure 16).

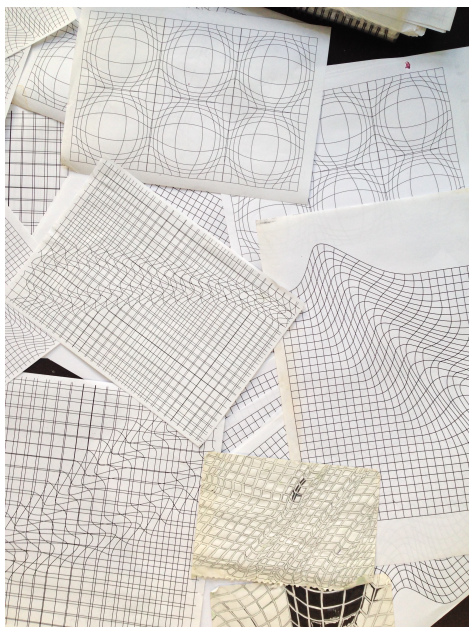


Figure 15: Sonja Brough, 2010, Images hand drawn and Illustrator drawn, paper

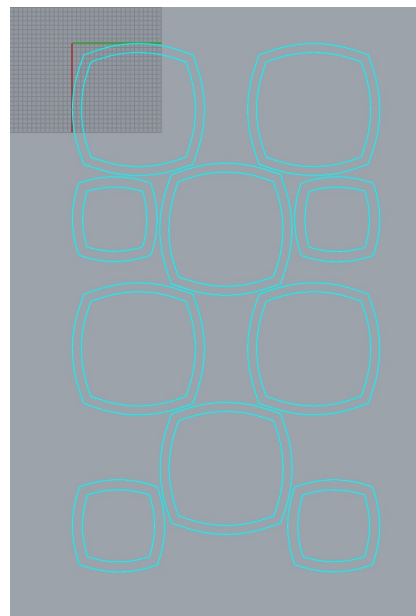


Figure 16: Sonja Brough, 2012, screen shot, slices of object to be laser cut, computer screen

The time spent in this virtual space provides a haven from which to explore form without the material constraints slip proposes. After printing out the grids, I enwrap simple geometric forms such as the cube and cylinder. I then draw the surface by tracing over the grid. When I trace over the computer-generated grid I am constantly searching for possible and challenging pathways to develop the fluid form. I use the grid in my work as a structural guideline and decorative boundary.

This process does not involve a hierarchical system between the interior and exterior; it allows the emergence of new forms.

It became apparent to me that this was an opportunity for me to engage with current computer-aided design methods. Drawing the warped grids in the computer and then hand tracing over the grid with slip provides an opportunity for the hand qualities of the gestural line to converge and provide soul to a manufactured spatial layout. The language of these techniques informed the gestural translating process. To draw an object then slice it up, then cut it out or print it out was a construction method I felt excited about.

The physical nature of layering trails of clay led me to imagine what a 3D printer could achieve with the visually penetrable objects I had developed? Was there a way I could save the pain that develops in my hands from gently squeezing the bulbous slip trailer for hours? These questions led me to conduct extensive research on types of 3D printers, materials used and who is doing what around the country in this field of innovation.

Drawing gestures of the grid is a method of building, placing gesture upon gesture, the highly repetitive action creating a language of process. Slight vibrations give clues to the work being hand constructed. This is directly opposed to machine-made 3D-printed output. There is, however, a similar quality between the printers that use clay and the paper porcelain that I use in my three-dimensional structures.

There are many other artists whose work deals with various technological constructs, and a selection of those artists are part of *HYPERCLAY: Contemporary Ceramics* which is an Object: Australian Centre for Design touring exhibition. The one artist from this exhibition I was particularly interested in was Roderick Bamford. I attend a workshop on 3D design with Roderick Bamford at the School of Architecture, University of Tasmania. His current research has been on adapting printers to use clay slip instead of plastics. The workshop had a focus on designing objects using the open source computer program Grasshopper, then printing the object before taking a plaster mould of the plastic printed object (Figure 17). When playing with the plastic 3D printing technology I appreciated the lined formations of the support structure as well (Figure 18).



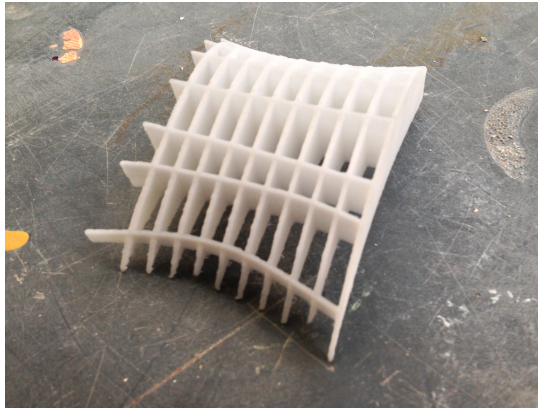


Figure 17: Sonja Brough, 2013,  
3D print of Grid, plastic

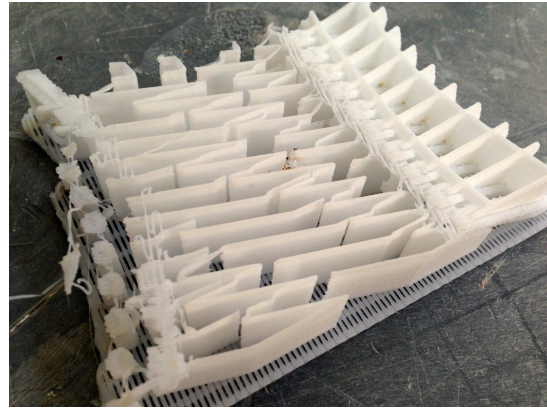


Figure 18: Sonja Brough 2013,  
Base to 3D print of Grid, plastic

Since I had already successfully used the technology for mould making something similar, using the laser cutter and CNC router at the School of Architecture to produce moulds for other works such as the collaborative Alumina Pendant Lamp with the designer David Houbaur from dhab Design Studios, I was actually seeking insight into the capabilities of current clay printers to produce my work. However I unfortunately discovered that the technology available to the individual is still cumbersome. This experience reconfirmed that producing these works in an analog manner gives me control over the outcomes.

The most troublesome technical challenge to overcome in the three-dimensional structures is the shrinkage of the porcelain slip. I add toilet paper pulp to a deflocculated slip, mixing it up in large batches. The process I use in testing the viscosity of the slip is not a valid scientific method. It is about the feel and visual flow of the slip. I dip paper towel into the slip after the paper pulp is added, also fill the slip trailer up with slip and draw lines over the already slip soaked paper towel (Figure 19). The viscosity needs to be high,

similar to honey. I decided to keep and fire some of these tests (Figure 20) as I felt they may lead to another body of work.



Figure 19: Sonja Brough, 2013,  
Slip Viscosities, porcelain



Figure 20: Sonja Brough, 2013,  
Slip Viscosities, porcelain

The architectural works by American Andrew Kudless and Lab Architects are just two examples of a large cohort of architects who are currently orientated towards the surface lending itself to the effects of manipulation and deformation. Computer technology used in the advanced manufacturing industry has driven these new initiatives to focus on expressing the voice of materials' inherent qualities. The surfaces operate much like volume and mass, which previous modernist architectural generations strived to mute in favour of the immaterial, expressed by uniformity. American architect Peter Eisenman quotes Juhani Pallasmaa a Finnish architect so poignantly:

The Modernist surface is treated as an abstracted boundary of volume, and has a conceptual rather than sensory essence. These surfaces tend to remain mute, as shape and volume are given priority; form is vocal, whereas matter remains mute. The aspiration for geometric purity and reductive aesthetics further weakens the presence of matter.

(Eisenman 1992, p. 11)

Donald Bates from Lab Architecture Studio describes their process of proximity to distance can also be manipulated to offer an expanded design for Federation Square in Melbourne, Australia as:

The exploitation of elevation and surface effects presents a great opportunity to create a different type of difference. This implies more than a 'wrapping up a new skin' approach to distinction and image. While there is no doubt that this approach involves 'image', it proposes a process whereby 'image contributes to the spatial and experiential engagement where surface is not superficial, but rather uncertain in its depth of influence and involvement. The experiential linkage of domain of form-into-surface'.

(Bates 2008, p. 160)

They use the surface façade to break up the mass of the building through combining the ideas of coherence and difference developed from working with slices of underlying rock formations. The end results are a conversion of surface patterning with object realisation whereby the boundaries are blurred between a structural requirement and the surface overlay. This integration of line formation opens up greater possibilities for buildings to dynamically express formal potentials and perceptual qualities of materials.

Although this process is not new in the 21st century, the digitisation of the design field combined with advanced technological machining of materials is. What was produced manually in the past has been replaced by the use of the

computer screen and virtual space.

These recently formed fluid surfaces, in particular, have been assisted by the use of parametric design methods, in which algorithms are used to define a set of boundaries to produce a form that flows with rhythms derived from nature. Matsys design studio based in California, USA, established by Andrew Kudless in 2004:

...explores the emergent relationships between architecture, engineering, biology, and computation. Based on the idea that architecture can be understood as a material body with its own intrinsic and extrinsic forces relating to form, growth, and behavior, the studio investigates methodologies of performative integration through geometric and material differentiation.

(Matsys n.d.)

Kudless's work has a wide scope, from speculative to built projects. The crafting of new tools facilitates an interdisciplinary approach to the design and fabrication of architecture. With particular focus on the construction of *P\_wall* (2009), Kudless achieves a synergy of material systems with an integration of 'form, growth and behaviour'.

Kudless's work in the construction of *P\_wall* (Figure 21) is of great interest to me because of the evocative visual effects he has managed to produce from combining plaster and a digital grayscale image to map the structure of the installation. His inspiration for the way he engages with materials is inspired by the work of Spanish architect Miguel Fisac and his experiments with

flexible concrete formwork in the 1960–70s. *P\_wall* attempts to continue this line of research and add to it the ability to generate larger and more differentiated patterns. A patterned surface emerges from the tonal qualities of the shadows, which is a result of the initial grayscale image interacting with the fluid nature of the poured plaster onto a flexible surface.



Figure 21: Andrew Kudless, 2009, *P\_wall*, plaster, dimensions variable



Figure 22: Sonja Brough 2015, working space

In order for me to create my work I need a large space — clear brain and no distractions. I start the process by mixing porcelain to the appropriate viscosities, one for casting and one for trailing. I have various types of cardboard, paper and polystyrene, all types of combustibles that will support and capture the slip, and ensure that piles of these materials are stacked in spaces ready to be on hand when they are required.

It appears to the outsider that my making space is a complete mess. Nothing I do is ever neat. Even when I eat, I scoff food down, pick it apart, dribble it on the floor, and chew rhythmically — enhancing the sensations and tactile desires of being immersed in a process.

Although my repetitive methods in life can be perceived as a meditative action they are actually not. I equate the process to walking a tightrope. This process of building places gesture upon gesture, the highly repetitive action creating a language of process. The slightest lack of attention can trigger a collapse of wall. I have found I have to get in the zone and stay in that obsessed space until the object is completed. The larger forms can take several weeks, as



opposed to the small forms (such as the tiny cubes) which take only minutes to complete.

Despite best efforts, the accident, which has occurred through inattention, does play a pivotal role in the development and evolution of the form. This is where the broken line is usually created, and at times I snap sections apart or deliberately drop them off the pieces when they come out of the kiln. This places them in a constant state of becoming, because these occurrences are a mix of my mood and the idiosyncrasies of clay slip; they are determined as unpredictable. This keeps me engaged, excited for the next discovery and adds to my knowledge of the material. I have no hard and fast rules about the production of the work while I am in discovery mode. I think this is why I never became a production potter although my work has strong links with the ideas of repetition and repetitiveness.

I see my work as drawings that I then fire. I work with porcelain because of the strange masochistic satisfaction from overcoming its challenges. As it vitrifies (turning into a glassy matter) it will move and relax, and it is at this point that the object gains its whiteness, but then it can collapse if too thin. The weight of the form can force it to slump or in extreme cases collapse. These are the idiosyncrasies that can determine the product — you can end up with this object you did not have before and which you did not intend. This leads to further explorations — the material pushes back on the concept.

The rhizome has been used in the presentation of this project rather than a systematic hierarchical linear structure. It is not about being literally organic, but instead offers a method of working.

'Rhizome' describes the connections that occur between the most disparate and the most similar of objects, places and people; the strange chains of events that link people: the feeling of 'six degrees of separation', the sense of 'having been here before' and assemblages of bodies. Deleuze and Guattari's concept of the 'rhizome' draws from its etymological meaning, where 'rhizo' means combining form and the biological term 'rhizome' describes a form of plant that can extend itself through its underground horizontal tuber-like root system and develop new plants. In Deleuze and Guattari's use of the term, the rhizome is a concept that 'maps' a process of networked, relational and transversal thought, and a way of being without 'tracing' the construction of that map as a fixed entity (Slaughter 2004, p. 232).

It is this rhizomic notion of the integration of mental and physical processes that allows me to more deeply understand the practical explorations and potential of the work.



### 3. FUNCTIONAL APPLICATIONS

Geometry is what I draw. The strict grid when learning a new skill sets up a regiment to follow. The grid leads into enwrapping — what happens when you construct objects out of a warped grid. Some objects are successful and some fail. Being able to visually penetrate the object, like when you are drawing things in an architectural computer program and you are slicing it, the object becomes transparent. It gives you an interplay between inside and outside that you do not get in the solid object. A sense of light and free in space; the surface is all the way through the object. This technique questions what is the surface, what is the pot — no boundaries. It all has to be interconnected so that it stands up — a functional necessity, yet conceptual hindrance — when working with the material there is a sense of grounding. This brings you back to the act of producing something — a level at which it has to remain functional.

The works are not made according to a linear timeline; one overlaps with the other and at times I find that I am unsure which came when. One thing that I am sure of, is that the slip must be at the correct viscosity combined with specific gravity to allow the successful outcome of an object.

The forms set out in the examination exhibit are not functional in the traditional context but rather the product of processes converging and arranging in small clusters. The pieces I make are not always functional vessels or completed objects — they are an essence of form. Form for me

means the product of a process, thus when I talk about functionality what I mean is that they hold together. When displayed they are not given the sobriety of the plinth, these are tests, experiments, thoughts — not finished fine sculptures. They are a tactile representation of my research.

I present the tactile as functioning in much the same way as UK philosopher Marty Slaughter describes the sensational aspect of art in French Deleuzian philosophy:

‘If for Deleuze the function for philosophy is to create new concepts, the function of art is to create new sensations and this entails releasing the sensation beneath and beyond representation’. As for Lyotard, the function of art is ‘not to imitate but to appear. Art makes visible the invisible force – for Lyotard the force of desire, for Deleuze the force of sensation. For Deleuze, art creates the experience of sensation by bypassing the brain and showing ‘on the nerves’ the intensities and collapses of force.’

(Slaughter 2004, p. 243)

My studio experimentation has been focused on the production of functional objects that nonetheless push boundaries of structure, surface and space. In line with material thinking I have used the physicality of resolving ideas, problem solving by creating more problems, as a cyclical mode of experimentation, evaluation, reflection and then further experimentation.

When constructing the linear forms I usually have the desire to start with needing to make a particular object such as small cubes or spheres (Figure 23).



Figure 23: Sonja Brough, 2014, grid and sphere in construction

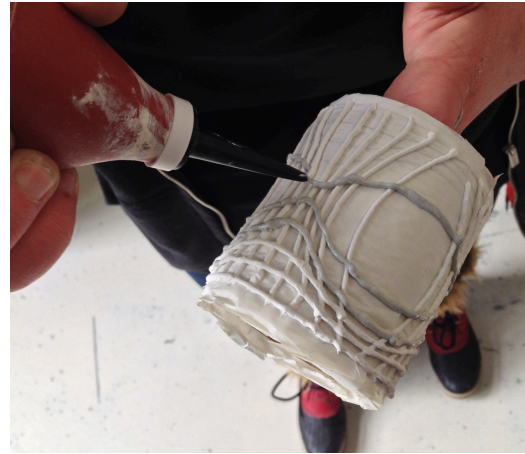


Figure 24: Sonja Brough, 2013, stubbie in construction

Their primary function is to test out grid arrangements and the working properties of the slip. Noting how the slip settles on the polystyrene indicates the necessary adjustments the slip may need; such as if it starts to crack as it dries, more paper pulp is needed. The adding and subtracting of materials is not done at a scientific research level. As I say to people 'it's not rocket science', but there is enough consistency in my methods that I can repeat forms with predictable results. Once I am satisfied that the slip is at optimum working capacity I move on to larger forms (Figure 24). As I find the predictable results become boring and burdensome, I am very much addicted to discovering more from processes. While practising the gesture of line I at times draw small circles on newspaper print. These round things usually get recycled back into the making batch but on one occasion I instead selected to document the stages of drying (Figure 25) and fire them (Figure 26). I then recognised that their function would be to become an element in another's art context. I bagged these small elements into zip lock bags and handed them to friends, family and colleagues.



Figure 25: Sonja Brough, 2013,  
Round Bits,  
coloured porcelain slip



Figure 26: Sonja Brough 2013,  
Round Bits, coloured porcelain slip

The following instructions were distributed with the 'round bits':

My name is Sonja Brough and part of my Masters of Fine Art degree I am investigating audience-activated artwork. I would appreciate your participation in this project. All you need to do is

1. Take at least 3 photographs of the contents in the zip lock bag. There are no restrictions.
2. Upload Images to the facebook page 'Round Bits'

<https://www.facebook.com/roundbits>

Or email them to [sonja.brough@facebook.com](mailto:sonja.brough@facebook.com)

Round Bits are made of Porcelain and could be considered a choking hazard for small children, pets and adults. The Round Bits are yours to keep!!!!

A Facebook page was created for the recipients to document what new life they had given the work. The response was quite disappointing, in the sense people were eager to accept the small round elements with the promise of doing something with them but, out of the 400 packages I distributed, only 20 images were returned. Although I enjoyed the process of giving these away as I do with a lot of my experiments; I really did not care what happened to them. The focus of this research was not to construct elements for others to use and was therefore a side step with in the project.

At an exhibition I had at s.p.a.c.e Gallery at Scotch Oakburn Launceston Tasmania in 2015, I displayed the round bits on the floor to demonstrate the nature of them being tiny castaway gestures. The restrictions of the space required me to place them on a plinth that visually linked them to the landscape. The result of this leads to misinterpretation of the work, for this reason I have chosen to display the work directly on the concrete floor of the examination space. Overlapping each other, hinting at the idea that they are an industrial byproduct of my practice. The piles of discarded tiny gestures create a dynamic aesthetic of chaos and entropy.

This exhibition also provided the opportunity for testing the arrangement of small clusters of similar line formations with slight differences in size constructs. The groupings converge together supporting the slight variations created through their method of construction.

Other subordinate intimate ideas laying grounded in the work arise when making. One of those ideas was addiction in an abstract awareness to the addictive nature of the processes I use. *Doing lines* 2012 at Sawtooth an artist

run initiative based in Launceston Tasmania, made reference to the obsessive patterning derived from line construction as an addiction – to the process addiction to the thrill. The physicality of the works created for this show were tests in triangular form constructions and colour developments. The horizontal display of the triangular forms (Figure 27) conjures ideas of the picture rail — intended to hold things and operating as the utilitarian support to a more remote aesthetic object. The vertically displayed works create a punctuation mark, arresting the flow, and stopping the gaze.



Figure 27: Sonja Brough, 2012, *Doing Lines*, installation, coloured porcelain slip



Figure 28: Sonja Brough, 2012, *Doing Lines*, installation, coloured porcelain slip

On an opposing wall I displayed the production of the handle less cups I call Smugs (Sonja mugs) (Figure 28) as functional objects that carry a surface decoration with optical qualities of repeat patterning and visual vibrations. Due to the nature of creating the patterning of the surface on the vessels, each one is individual. The gesture of rubbing/eroding the surface reveals what appears to be a complex geometry. I draw inspiration from current architectural iterative design methods and transpose these onto a super-flat surface but at times I leave a hint of the original textured surface to give clues as to its production process. The importance of touch to gain sensory

understanding of the material's transitional process in turn extends the contextual background to include other sensory sensations. The art is held in the decision-making, knowing when to stop and where to crossover the processes.

The Smugs in this exhibition would have laid visually stagnant if they had been displayed on plinths, but instead I colour-graded them in a snaking line across the gallery wall. This was also a way to resolve the problem of not seeing the individually patterned bottoms of the vessels, as each one is different: no two are the same. This method of display also dissolves their utilitarian characteristic into their primal decorative function and additionally evokes the fluidity produced in the slip-trailed line work.

Investigations into achieving a decorative fluid structure into other utilitarian objects led me to work further with dhab Design Studios, having successfully worked with David Houbaer on the slip cast design and construction of the Alumina Pendant Lamp (Figures 29 and 31) in 2011.



Figure 29: Sonja Brough and David Houbaer, 2011, process of slip casting Alumina Pendant Lamp, unfired porcelain in its making mould



Figure 30: Sonja Brough and David Houbaer, 2012, process of slip trailing the slip bowls,





Figure 31: Sonja Brough and David Houbaer, 2011, installation image of the finished Alumina Pendant Lamp, porcelain



Figure 32: Sonja Brough and David Houbaer, 2012, Slip Bowl, porcelain

The method of our collaboration was not to have one person design and the other make but instead there were no set boundaries, each of us crossing into the other's field of expertise. This fluid dynamic in the working partnership was important in terms of conceptual development and extending material structure. The fluidity is also reflected in the decorative structural outcomes of the Slip Bowls (Figures 30 and 32). The bowls delicately balance between an open and closed structure. The collaborative experience with Houbaer led to me using other computer-based technologies as a means of providing language to my hand-making methods. One of those technologies was the laser cutter from the School of Architecture and Design at the University of Tasmania, which primarily cuts slices of designed objects into cardboard



before it is reassembled back into an object. The space between the slices and the objects provided an area to inject into my making methods, such as developing individual circular slices of porcelain slip, to then dollop-trailed slip. The dollops provide structure between the slices and mechanical opens the object. Varying the methods of application dictates how the form bends and distorts in the kiln (Figure 33).



Figure 33: Sonja Brough, 2015, *Slice then Dollop*, porcelain



Figure 34: Sonja Brough 2012, *Deformation*, coloured porcelain slip

The distortions provided by the kiln's heat reflect back on the porcelain slip's fluid beginnings that were otherwise displaced during the methods of the making process. There is the sensation of excitement generated by having no control in this. The voice of the material sings loudly, its inherent qualities insistently taking charge of the formation of the form. I learn something new to take forward into the next experiment. This is the pushing and pulling action carried out in my research.

The shadow provides another transient interpretation of the material's expression of the architectural context, stimulatingly casting lines of a past, present and future form.

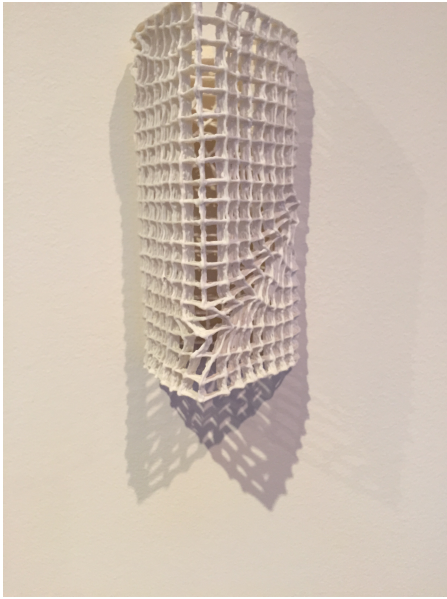


Figure 35: Sonja Brough, 2015, *Triangular Form*, porcelain slip



Figure 36: Sonja Brough, 2015, *Test Cubes*, coloured, porcelain slip

I have at times presented my work against a black space that makes reference to the virtual design environment.

## Conclusion

The aim of this research was to extend the functional applications afforded by clay slip, when considered as a structural rather than decorative form, creates the capacity for a fluid, expressive and organic architecture to emerge. This was achieved by deviations that emerge when translating the digital 2D into ceramic form. The material is bound in the concept and the utilitarian value of the experiments shows how it can corrupt the perfection of the digital process.

The methods I employ for construction in clay slip floats in an experimental virtual space alongside the utilitarian object. My process starts with a flat computer image and then I structurally build layer upon layer. To extend the functional applications afforded by clay slip, when considered as a structural rather than decorative form, creates the capacity for a fluid, expressive and organic architecture to emerge. Future applications of this method can be extended to produce larger more resolved forms that evoke the experimentation carried out in this research. Using ceramic materials in 3D printers is very current with individual artists in the areas of form development and has the potential to extend the possibilities of what can be constructed with clay slip.

My process begins within the 2D space either in the virtual architectural design application or the hand-drawn image, and moves to the material of porcelain slip. The material's inherent qualities push back on the concept, directing further flow and movement. This process of translation can also be a

hindrance in that the slip can crack when used over a combustible form so the alterations of adding various quantities of paper pulp to the slip is a necessity in achieving successful outcomes.

The deviations which emerge through the intersections of digital technologies and analogue processes — pouring, trailing and drawing with slip — expands our understanding of form and geometry, and extends synergies with the organic rather than the Cartesian matrix. This is where unknown territory is explored; new dichotomies are created and old ones revisited, constantly re-directing attention through observations made during the constructing process.

The general problem, posed in ceramics, was to find a suitable means to navigate these concerns at the intersection of space, structure and surface. The use of material relationships through material thinking and combining them with opposing modernist constructs of space are a useful means of navigating the intersections of the surface, structure and space.

The outcome was a series of experimental objects created from clay slip that interweave and respond to aspects of digital technological and material processes in producing a series of speculative forms. They need to be viewed as experiments, not in the scientific format but in a manner of adventurous exploration.

I abandoned the plinth for displaying as it is connected to the finished gallery object and decided to use only the wall and floor. The gallery walls provided conceptual boundaries for grouping the experiments because of the walls

existing gridded format. Some forms floated in the in-between giving clues to their virtual beginnings. Increasing the capacity of the ridged object to express its fluidity, even after it is fired, giving clues to the material's pre-fired existence. The project does not end with the final display, as concepts generated from one arrangement will re-emerge in another.

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